

objects appeared to be considerably elevated above the surface of the ground; the phenomenon continued for more than half an hour.

Mirages were reported to have been observed at the following places:

Salina, Kans., 13th, 29th, 30th.  
Henry, Dak., 15th.  
Moorhead, Minn., 15th, 18th, 23d, 24th.  
Marquette, Mich., 16th, 17th.  
Reidsville, N. C., 18th.

## MISCELLANEOUS PHENOMENA.

### FOREST AND PRAIRIE FIRES.

Kingston, Ontario, 20th: on this date extensive brush fires prevailed in district between the Mississippi and Wilbur Mines.

Brainerd, Crow Wing Co., Minn.: on the 20th forest fires were raging southeast of this place; a large quantity of hay was destroyed.

Oswego, N. Y., 26th: the dense smoke settling over Lake Ontario from forest fires which are burning on the Canadian side renders navigation on the lake very dangerous.

Saint Vincent, Minn.: prairie fires were raging four miles southeast of station on the afternoon of the 20th, and extensive fires were burning southwest of station on the 30th.

Webster, Day Co., Dak., 30th: prairie fires have been very prevalent in this locality since the 20th.

### INSECTS.

Quakertown, Bucks Co., Pa., 1st: caterpillars are destroying the leaves on trees and vines to a great extent in this vicinity.

University, Lafayette, Co., Miss., 10th: cotton worms have damaged the cotton crop considerably during the past week.

Lead Hill, Boone Co., Ark., 30th: during the latter part of August and the first half of September chinch bugs were very numerous, and greatly injured the corn in this county. The cotton caterpillar has also reappeared, but has done no serious damage. The bollworm has done considerable injury to cotton in this section.

East Portland, Oregon, 30th: a species of slug has made its appearance in large numbers in this vicinity; it destroys the leaves of plants and also enters the ground and eats sprouting seeds.

### METEORS.

Fort Maginnis, Mont.: a meteor of considerable brilliancy passed over this place from southeast to northwest at 12.10 a. m. on the 10th.

Willows, Colusa Co., Cal.: a beautiful meteor was observed in the east at 8.30 p. m. on the 27th; it moved northward about 25°, was as bright as Venus, visible five seconds, and before disappearing separated into several pieces.

During the evening of the 15th a meteor was observed at many stations in New England and the Maritime Provinces of Canada, and by several vessels over adjacent portions of the north Atlantic. While many of the reports concerning this meteor, as given by the public press, were probably exaggerated, the phenomenon was undoubtedly of more than ordinary interest, and the extent of the area over which it was observed and other characteristics noted during its flight were exceptional.

Below are given some of the numerous reports which have reached this office:

Capt. T. L. Rogers, of the s. s. "Wylo," reports: "September 16th, 1.08 a. m., Greenwich mean time, when six miles south of Bird Rocks, Gulf of Saint Lawrence, saw a brilliant meteor descend from an elevation of about 20°, bearing ssw. true, and falling a little to the westward of the perpendicular. It had a very large and bright appearance, and its trail had a vermilion brightness which may have been caused by the hazy state of the atmosphere. The wind was northwest and the weather fine, but a little hazy, and the barometer steady at 30.08."

The following are extracts from an Augusta, Me., "special," dated the 18th, to the "New York World":

As seen here (Augusta, Me.) it burst forth at a point about midway between the zenith and horizon in the eastern heavens, shooting at about an angle of 45° northward and maintaining its brilliancy until it dropped behind the hills. Its movement was not very rapid and it was several seconds in passing before the vision. An eye witness describes it as being "large as a cart wheel and equipped with a tail thirty feet in length. The nucleus or head rivalled the electric light in brightness, while the brush-like tail was of a pinkish hue."

Reports from various country towns are that many of the people were overcome with fear, and some even took refuge in their cellars. Those who did not get a distinct view of the meteor, but saw the light, regarded it as a flash of lightning and listened for the roll of thunder. The fall was two minutes before eight o'clock in the evening and the sky was cloudless.

In Bangor, seventy miles east of here, the meteor was still more prominent and created much excitement.

At Halifax its appearance was accompanied by a terrific concussion and a sound heard like that of a heavy clap of thunder, followed by detonations at intervals for several seconds. People rushed from their houses in alarm, fearing that an earthquake was at hand. Indeed, the earth trembled perceptibly. Intelligence from Saint John's, Newfoundland, says that the great fire ball was distinctly seen there, and, after it had disappeared, a thin luminous cloud apparently lay at that point in the heavens where it first burst forth.

Sergeant Paul Daniels, Signal Corps, New York City, furnishes the following report copied from the log of the British s. s. "France," Capt. A. D. Hadley, commanding; Mr. John Rees, first officer:

September 16, 1887, at 9.15 p. m., ship's time, in lat. 41° 31' N., and long. 68° 48' W., observed a very large meteor, bearing from the ship north, and travelling in an altitude of about 45° above the horizon; had the appearance of a rocket and was very brilliant, so much so that the ship's deck was so illuminated as to enable a person to pick up a pin. It lasted about six seconds, and was of a light blue tint, resembling sulphur on fire. Weather at the time, clear; many stars visible. Barometer, 30.04 (corrected). Temperature of air, 67°; water 68°, and calm. Weather before and after phenomenon clear, and sea smooth.

Sergeant J. H. Melton, Signal Corps, Boston, Mass., forwards the following abstract from the log of the s. s. "British Crown," Capt. A. Smith, commanding; Mr. Francis Potts, second officer.

September 15, 1887, in 42° 50' N., 68° 15' W., at 9 p. m., observed a large meteoric body, intensely bright, fall from the zenith in an easterly direction, which completely illuminated the whole heavens for about five seconds, and disappeared at an altitude of about 10° from the horizon to eastward. It resembled a ball of fire about two feet in diameter and was followed by a bluish trail of light. It at first appeared to fall very near the ship, but passed off to eastward in its descent. Immediately after its disappearance the sky and heavens became blindingly dark.

The following is from the "Portland (Me.) Press" of September 22, 1887:

Boston, September 21.—Captain Walker, of the Cunard steamship "Cephalonia," just arrived in Boston, reports having seen the meteor on the night of September 15th at 8.30 o'clock. At this time the steamer was in N. 42° 28', W. 66° 22'. The meteor was observed to the east-northeast, and was very brilliant, sparks radiating from the centre, and it had a long, fiery tail. The sky was brilliantly illuminated for the space of six seconds. The meteor fell into the sea about half a mile from the ship.

The "Bulletin of the New England Meteorological Society" for September, 1887, contains the following:

A large meteor of brief duration was noticed by several observers a little after 20 h. on the 15th. A newspaper report states that it was followed by a terrible roaring noise at Barrington, N. S., where it was seen in the southeast, moving to the south. It appeared overhead at Bar Harbor, Me., and moved southeast. At Grafton, N. H., it was seen in the east or southeast, at an altitude of 25°, first red, then yellow, when it disappeared below the horizon, leaving a long trail visible. At Leominster, Mass., it moved through the eastern sky from Pegasus to Aries. At North Truro, Mass., it fell to the east-northeast. At Nantucket, Mass., and at Setauket, N. Y., the meteor was not seen, but the sky was lighted up by it. It was probably nearly a hundred miles above the earth when it became visible.

Meteors were also observed during the month on the following dates:

1st, Orono, Me. 3d, Starkey, N. Y. 5th, Pekin, Ill.; Orono, Me.; Weldon, N. C. 7th, Cedar Keys, Fla.; Wauseon, Ohio. 8th, Cedar Keys, Fla.; Woodstock, Md. 9th, Fort Sully, Dak.; Trenton, Tenn. 12th, Manatee, Fla.; Harvard, Nebr. 13th, Woodstock, Md.; Kalamazoo, Thornville, and Benzonia, Mich.; Jacksonborough, Ohio; Tatoosh Island, Wash.; Mount Angel, Oregon; Riddleton, Tenn. 14th, Fort Sully, Dak.; Manatee, Fla.; Starkey, N. Y.; Delavan, Wis. 15th, Bar Harbor, Gardiner, and Eastport, Me.; North Truro, Mass. 16th, Yuma, Ariz. 17th, Taunton, Mass.; Kalamazoo, Mich.; Beverly and Egg Harbor City, N. J.; Factoryville, N. Y. 18th, Calumet and Kalamazoo, Mich.; Dover, N. J.; Wauseon, Ohio. 19th, Mauzy, Ind.; Egg Harbor City, N. J. 20th, Fort Sully, Dak.; Logansport, Ind.; Wauseon, Ohio; Rappahannock, Va.; Columbia, S. C. 21st, Manatee and Cedar Keys, Fla.; Crete, Nebr.; Yaquina Lighthouse, Oregon; Wytheville, Va.; Vashon, Wash. 22d, Rappahannock, Va. 23d, Webster, Dak.; Titusville, Fla. 25th, Butlerville, Ind. 26th, Marquette, Nebr.; Rappahannock, Va. 28th, Trenton, Tenn. 30th, Fort Sully, Dak.

#### MIGRATION OF BIRDS.

*Geese flying southward.*—Nicolaus, Cal., 9th, 12th, 17th;

Sacramento, Cal., 15th, 30th; San Diego, Cal., 19th; Fort Buford, Dak., 21st; Salina, Kans., 13th; Grand Haven, Mich., 2d, 9th; Poplar River, Mont., 25th, 28th; Crete, Nebr., 21st; Albany, Oregon, 6th, 10th, 22d; Linkville, Oregon, 11th, 16th, 28th; Wellsborough, Pa., 25th, 26th; Fort Canby, Wash., 4th, 28th; Pysht, Wash., 15th; Port Angeles, Wash., 28th.

*Geese flying northward.*—Fort Sully, Dak., 24th; Linkville, Oregon, 26th.

*Geese flying eastward.*—Little Rock, Ark., 23d.

*Ducks flying southward.*—Little Rock, Ark., 23d; Erie, Pa., 16th; Tatoosh Island, Wash., 2d.

*Brants flying southward.*—Independence, Kans., 27th.

*Cranes flying southward.*—Independence, Kans., 27th.

#### SAND STORMS.

Yuma, Ariz.: a heavy sand storm prevailed from 1.50 to 3.25 p. m. on the 19th; maximum velocity of the wind during the storm, thirty-eight miles per hour.

A sand storm is also reported to have occurred at Fresno, Cal., on the 5th.

#### SUN SPOTS.

Mr. H. D. Gowey, of North Lewisburg, Champaign Co., Ohio, reports having observed sun spots on the following dates: 3d, 4th, 14th to 21st.

### VERIFICATIONS.

In consequence of the urgency of other work the detailed comparison of the tri-daily indications for September, 1887, and the average percentages of verifications, have not been completed in time for publication in this REVIEW. The usual data in connection will, however, appear in the succeeding number, as it is not considered advisable to delay the current issue.

#### LOCAL VERIFICATIONS.

The following is from the report of the "Michigan State Weather Service" for September, 1887:

Weather and temperature signals are now displayed in one hundred and forty-three towns in the state, and on the baggage-cars of twenty-five trains on seven principal railroads of the state.

The percentage of verification of weather signals for September is as follows: (the verification is taken from reports of displaymen furnished this office monthly) temperature, 82.8 per cent.; weather, 86.5 per cent.; temperature and weather, 84.7 per cent.

The percentage of verification of weather predictions for September on the D., G. H., and M. R'y., is 84.2 for weather and 80.8 for temperature; on the C. & G. T. R'y., weather, 85.3, and temperature, 83.5; P. H. & N. R'y., weather, 88.6, and temperature, 81.5; M. C. R'y., for weather, 84.0, and for temperature, 82.8; G. R. & I. R'y., weather, 80.7, and temperature, 79.5; C. & W. M. R'y., weather, 85.0, and temperature, 83.3.

The following is from the September, 1887, report of the "Minnesota Weather Service:"

Verifications of weather signals for Minnesota were 80 per cent. for weather and 78 per cent. for temperature.

The following is from the September, 1887, report of the "North Carolina Weather Service:"

The percentage of verifications as determined from seven points in the state is as follows: weather, 80.1 per cent.; temperature, 78.2 per cent.

The following is from the September, 1887, report of the "South Carolina Weather Service:"

The percentage of verification of the weather and temperature predictions for the whole state was: for weather, 82.9 per cent.; for temperature, 80.8 per cent.

The following is from the "Tennessee State Board of Health Bulletin" for September, 1887:

The percentage of verification of weather and temperature predictions, furnished daily from the Signal Office at Washington to the various stations in the state during the month, was for the state: weather, 79.1 per cent.; and temperature, 88.2 per cent.

#### ERRATUM.

July, 1887, REVIEW, page 185, first column, make "Barbadoes, on the 20th, moving east. It then moved eastward," etc., read, "Barbadoes on the 20th, moving west. It then moved westward," etc.

### STATE WEATHER SERVICES.

The following extracts are republished from reports for September, 1887, of the directors of the various state weather services:

The "Alabama Weather Service," P. H. Mell, jr., of the Agricultural and Mechanical College, Auburn, director:

The month of September was singular, both on account of the continued drought over the first two-thirds of the period, and the high range of temperature at all stations during a greater part of the first half of the month. In north Alabama the thermometer reached as high as 104°, and before the close of the month there was a depression of more than 50°; but this cold wave did not strike the state until the last two or three days of the month. The heavy rain of the 16th and 17th that passed over the entire state, accompanied in many sections by violent electric displays, did much damage to both life and property. This storm was evidently the result of the passage of the low pressure across the northern part of the United States. In some sections of Alabama strong winds prevailed, coming from the southwest.

Crops of all kinds have suffered more or less on account of the dry, hot weather that extended over the greater part of the month. And the season

was very favorable for the multiplication of many injurious insects. The "Aletia" did great damage to the cotton plant, reducing the yield of staple, in some sections, to quite a low figure. One advantage of the warm dry season was the rapid opening of the cotton; and the farmers were able to pick it out rapidly on account of the many fair days without rain.

#### Summary.

*Temperature (degrees Fahr.).*—Monthly mean, 73° 8'; highest monthly mean, 78° 6', at Fayette; lowest monthly mean, 66° 5', at Opelika; maximum, 104°, at Fayette, on the 11th and 12th; minimum, 39°, at Evergreen, on the 26th; range for state, 65°; greatest local monthly range, 60°, at Evergreen; least local monthly range, 30°, at Union Springs; greatest daily range, 83°, at Tusculumbia on the 9th; least daily range, 0°, at Bermuda on the 19th.

*Precipitation, including melted snow (in inches).*—Average for the state, 8.51; greatest, 7.16, at Auburn; least, 1.28, at Pine Apple.

*Winds.*—Prevailing direction, southwest and southeast.